PUNA GEOTHERMAL VENTURE PROCESS SAFETY MANAGEMENT EMPLOYEE PARTICIPATION PROGRAM

A. PROGRAM APPLICATION

At the PGV facility, the pentane process is applicable to the Hawaii OSHA process safety standard due to the fact that there is more than 10,000 pounds of the pentane flammable liquid, on location, at any one time. This includes the bulk storage tanks of pentane, the pentane process equipment and all portions of the facility equipment where pentane exists (see attached list of major pentane equipment and process area location map).

B. PROCESS SAFETY MANAGEMENT PARTICIPATION

1. PGV clearly recognizes the importance of consulting and involving employees in the process safety program activities and will foster the continual participation by all applicable employees. Employee involvement in the process safety program elements will vary based on employee knowledge and job or task assignments.

   General program awareness information will be communicated and employees will be consulted typically during monthly employee safety meeting. On occasion safety program information bulletins and special meetings will be utilized.

   Operations training will be via classroom type sessions, one on one or group task field instructions and demonstrations.

   Ongoing training will be via safety or operations meetings and one on one or group task field instructions and reviews.

   Employees will also be consulted on training sessions and operating procedures to ensure accuracy and effectiveness.

   PGV will ensure that all employees and contractors who work on or around the pentane process will be involved in the process safety program.

   PGV employees who do not work specifically on or around the covered process will be familiarized with the program's existence and of the general hazards of pentane.

2. For employees or contractors who will work on or near the pentane process consultation and\or involvement will include one or more of the following elements:

a. PHA team membership

b. Review and discussion of PHA team findings and recommendations

c. Review of specific hazards and related PSM program elements

d. Participation (or consultation) in educational sessions on process safety program elements, related operational training, educational activities and reviews and/or application of process safety program elements - Such as:

-Process information
-Process hazard analysis data from team activities
-Operating procedures
-Safe work practices training
-Emergency planning, response and shutdown
-Process changes - management of change elements
-Interface with contractors
-Pre-start up reviews of new/changed processes-equipment
-Equipment testing and inspections
-Hot/Safe work program
-Incident reporting and investigations
-Program audits
-Lockout program
-Confined space program
-PHA analysis methods
-PHA conclusions and recommendations resolution activities
-PHA updates and revalidation activities
-Process overview educational activities
-Refresher training activities (minimum every 3 years)
-Operator consultations
-Training of temporary employees
-Lockout-tagout program

C. EMPLOYEE PARTICIPATION IN PHA

Employees who work on, or are familiar with the pentane process, the related equipment, hazards, analysis methods, etc., will participate as team members for process hazard analysis. The team membership may vary depending on the portion of the process being analyzed. Other employees will be consulted on specific process items.

Process hazard analysis members will include at least the personnel listed on the attached team list.

During the process hazard analysis activities and the initial and ongoing program management and employees will be involved and consulted. This includes employee representatives, as applicable.

Employee involvement will begin, for some, when the team is established. For others it begins on the first day of employment, for new employees, and for existing employees as the program elements are implemented.

D. PROCESS SAFETY MANAGEMENT INFORMATION ACCESS

Process safety program information will be accessible to all employees. A large part of this information is contained in the Plant Operating & Training Manuals and the Technical Manuals (Job Books) which are openly accessible to all employees. They may request other specific information from their Supervisor, Plant Engineer or Site Manager. Documents may be loaned or copied. Trade secret provisions may require confidentiality agreements before providing the information. Other elements will be contained in the facility Safety Procedures Manual.

Other information related to the process, equipment, inspections, etc., will be accessible through the engineering, maintenance and safety departments

MAJOR PENTANE PROCESS EQUIPMENT

40-P-42	Pentane Transfer Pump
40-V-42A	Pentane Storage Tank
40-V-42B	Pentane Storage Tank
30-ACC-11, 12 13, 14 15 & 21, 22, 23, 24, 25	OEC Condensers
30-HXP-11, 12, 13, 14, 15 & 21, 22, 23, 24, 25	OEC Preheaters
30-HXV-11, 12, 13, 14, 15 & 21, 22, 23, 24, 25	OEC Vaporizers
30-PF-11, 12, 13, 14, 15 & 21, 22, 23, 24, 25	OEC Pentane Feed Pumps
30-ST-11, 12, 13, 14, 15 & 21, 22, 23, 24, 25	Feed Pump Strainer
30-TK1-11, 12, 13, 14, 15 & 21, 22, 23, 24, 25	Hotwell
30-TP-11, 12, 13, 14, 15 & 21, 22, 23, 24, 25	Pentane Turbine

B:DB518/File 6.12.2
Revised November 4, 1994

PROCESS SAFETY/HAZARD ANALYSIS TEAM

Team Qualifications:

David H. Berube (Site Manager)

Hazard Analysis Team Leader

Dave has a B.S. degree in Chemical Engineering in addition to operations management experience in the chemical, food processing, power producing industries. He is experienced in operations, maintenance and safety. Dave's training is in hazard control with chemical and allied related industries that include specific coverage of hazard surveys, risk evaluation, use of quantitative risk criteria in hazard analysis, process plant safety, and training in hazardous chemical safety and emergency response.

John Gerbitz (Maintenance Manager)

John is trained in Naval nuclear power schools, with 7 years experience in operations of Naval nuclear reactors on submarines, and is qualified in three different reactor groups.
Additionally, he has 17 years experience at the Hilo Coast Processing Company, a high-pressure combine fuel cogeneration plant as an Operations Supervisor to the Plant Superintendent.
John has also participated in hazard assessments related to community RTK planning, administered safety program activities and participated in safety committee activities.
He is familiar with the PGV facility by knowledge, or process and equipment due to the fact he has been on-site during all construction activities. He became familiar with equipment at is was being installed and maintained.

Jim Fordham (Senior Mechanic)

Jim has 15 years experience as a machinist. He has been with the project for over two years and has been involved in developing safe maintenance procedures. In past employment, Jim has served on safety committees and was recently promoted to Lead Mechanic at PGV.

Larry Harvison (Senior I/E Technician)

Larry has 15 years experience in the electrical and instrumental field. He has supervised the construction of power plants for the past 5 years. Larry has intimate knowledge of the instrumentation and control logic of PGV.

Darren Hunt (Lead Operator)

Darren currently holds the position of Lead Operator with 9 years experience at other Geothermal facilities. He is also the designated site safety coordinator at PGV. Past practical work experience include positions as, shift supervisor, safety officer, along with an extensive knowledge in operation procedures and safety activities.

Mike L. Kaleikini (Operations Manager)

Michael holds the position of Lead Operator and is familiar with the Plant from a process and control room operation standpoint. He is a valuable member of the team due to his extensive knowledge of the process and the fact that he has participated in the development of operating procedures at PGV. Michael's past naval experience as a supervisor of preventative and corrective maintenance on gas turbine engines, and their associated support systems, also lends itself to his value as an employee.

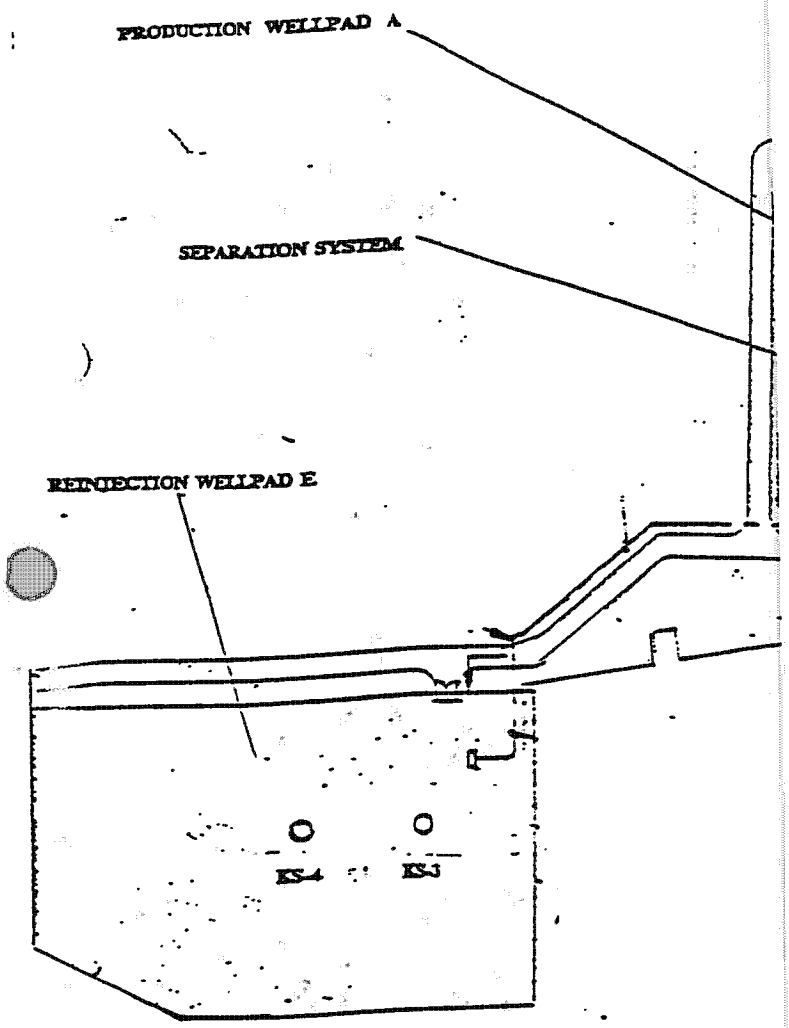
Peter Arthur (Plant Engineer)

Pete has a BS and MS degrees in Mechanical Engineering and holds Professional Engineering licenses in four states, including Hawaii. He brings valuable experience from the exacting aerospace industry. His experience includes work in instrument calibration and PSV certification program and Maintenance Personnel Training programs. Pete has experience in equipment performance analysis and developed programs for Injury Protection.

Greg Davidson (Associate Engineer)

Greg has many years experience in drilling, operating and maintaining high pressure wells.

cc: Dave Berube
John Gerbitz
Pete Arthur
Peggy Stover-Catha
Darren Hunt
Mike Kaleikini
Larry Harvison
Jim Fordham


PRODUCTION WELLPAD A
SEPARATION SYSTEM
REINJECTION WELLPAD E
ES-4
ES-3